



# **Local Government Engineering Department**

LGED BHABAN, LEVEL-11, AGARGAON, SHER-E-BANGLA NAGAR,  
DHAKA-1207, BANGLADESH

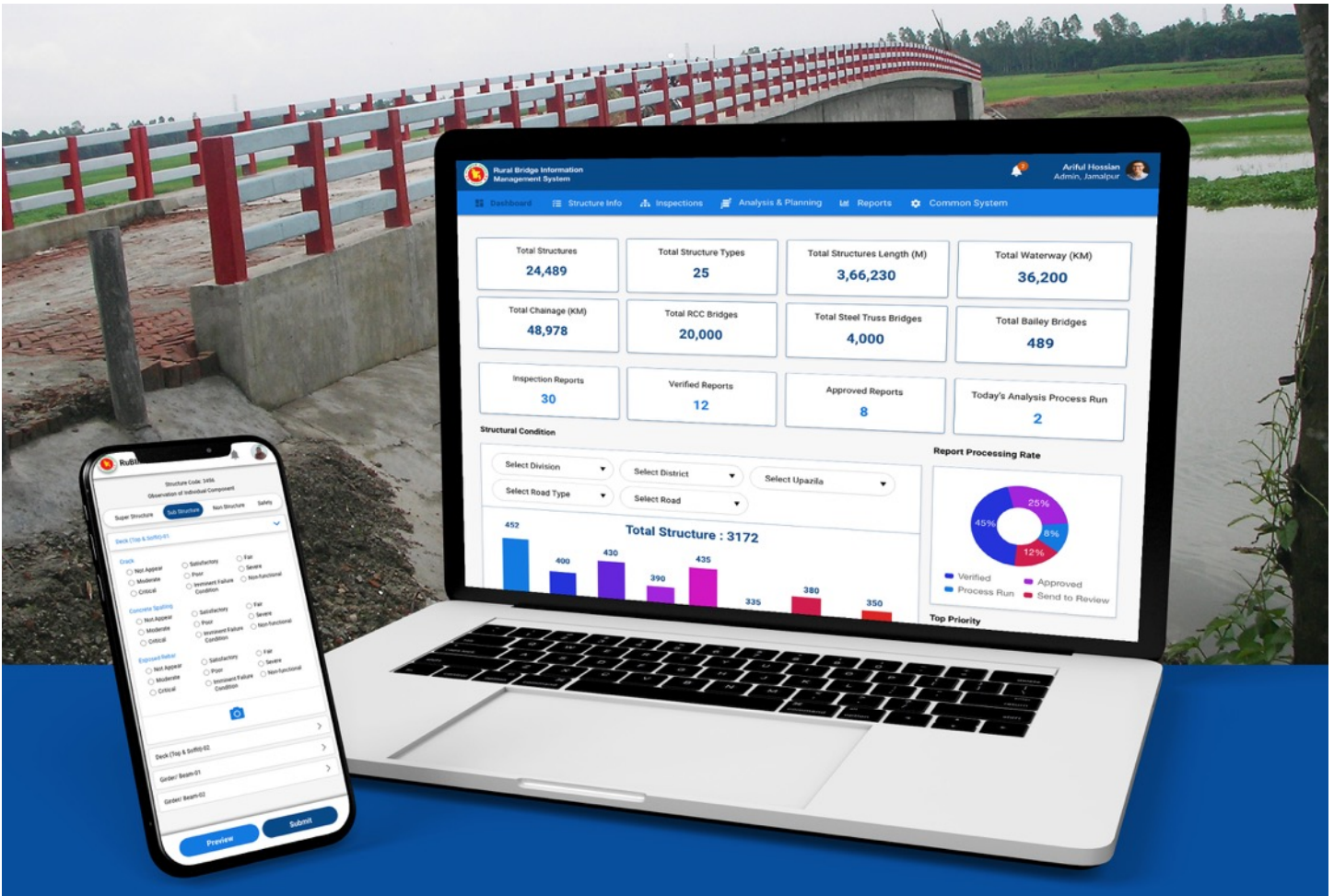
## ***User Experience Research and Analysis and User Interface Design Reports***

### **Product Title**

**Rural Bridge Information Management System (RuBIMS)**

### **Product Type**

**Information Management System**



## Introduction

To achieve the vision of Digital Bangladesh, LGED is deploying RuBIMS for inspection, bridge condition, and inventory information. The system will automatically generate bridge condition reports that are in good condition, poor condition, or need maintenance, providing this information to planning officers based on the inspection data.

## Problem Statement

LGED requires to know Bridge/Calvert's health condition to analyze or plan. Currently, the process works on manual paperwork. This leads to many mismatches between the collected data and existing data. It takes a lot of time and sometimes requires inspecting twice. There is no data repository, and the inspector cannot know the bridge history, so they have to work on assumptions. According to the inspector's report, the planning officer sometimes makes the wrong decision, which hampers time, cost, and effort.

## Challenges

- Digitalize and centralized all the users in a virtual platform.
- Paperless inventory or conditional inspection.
- Inspection Time and Cost consuming.
- Structure wise historical data accuracy.
- Geolocation wise structure tracking.
- Access management and Activity Log.
- User Friendly UI.

## User Research

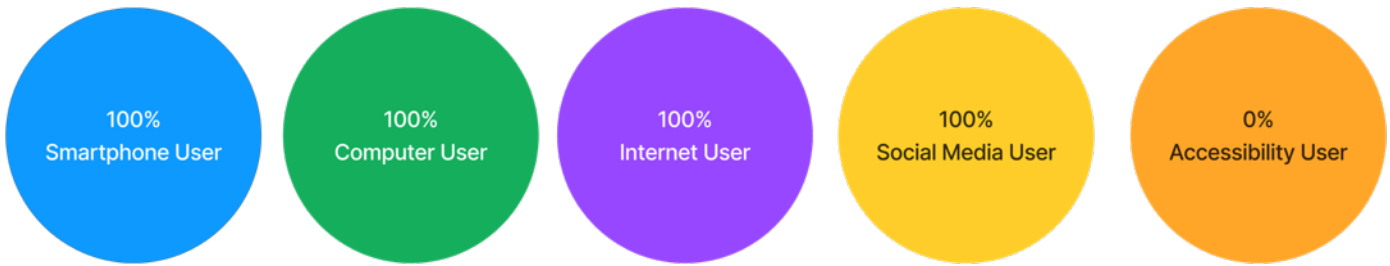
Talking with users to understand their needs, lifestyle, behavior, technical knowledge, problems, expectation etc. to make a better solution as their useability. For primary data collection and useability testing we conduct 5-10 user's qualitative interview.



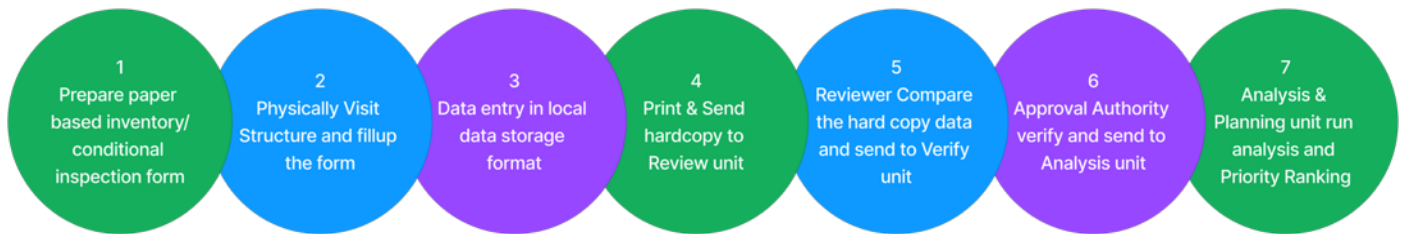
## Questionnaire

Name		Designation	
Phone No.		Social Media	
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Others		
Age	Religion	Favorite Color?	
Working Area	<input type="checkbox"/> Upazila <input type="checkbox"/> District <input type="checkbox"/> Division <input type="checkbox"/> Region		
Phone?	<input type="checkbox"/> Smartphone <input type="checkbox"/> Tablet phone <input type="checkbox"/> Featurephone		
What you do most with mobile phone?			
Do you use mobile internet?		Internet operator?	
Computer?	<input type="checkbox"/> Desktop <input type="checkbox"/> Laptop		
What you do most with computer?			
Will you be comfort to work with mobile Apps?	<input type="checkbox"/> Yes <input type="checkbox"/> Training Needed		
What is your <b>regular</b> working process?			
Please share about what are the <b>challenges</b> do you face, when you audit/survey by paperwork's?			
What are your <b>suggestions</b> you think to include for the Digital RuBIMS apps?			
Usability Feedback			

## Technical Knowledge



## Regular Working Process

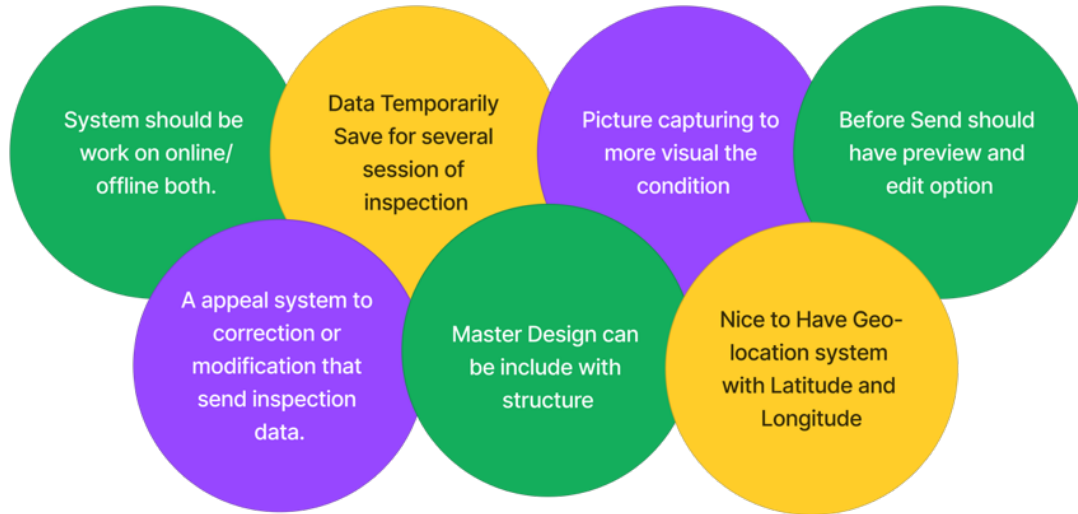


## Pain point

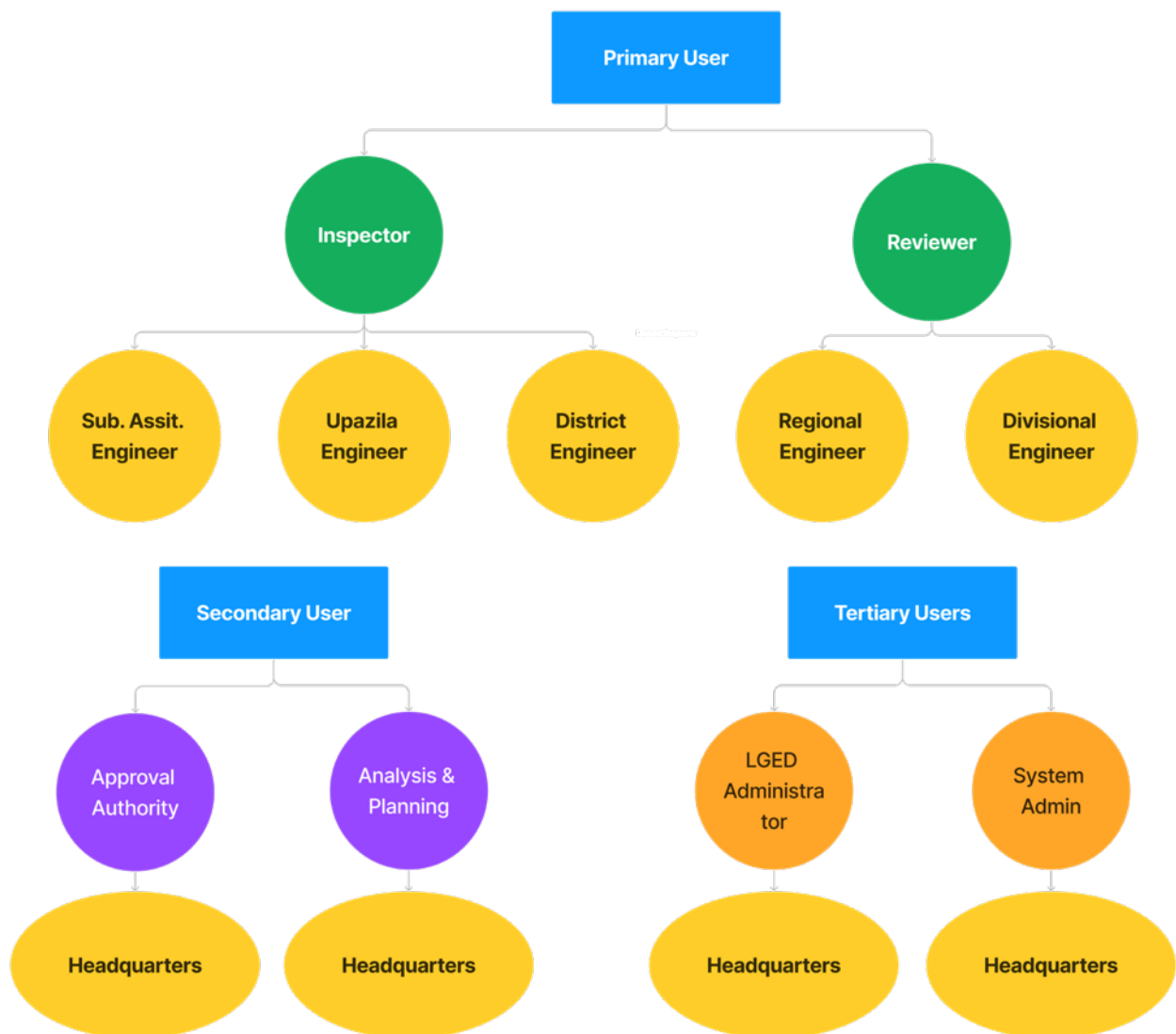




## Common Goals Identified



## User Type



# User Flow





As an Engineer I am the responsible to make the structure fit for the public usage. So I honestly required digital system and sometimes I have to decide in assumption lack of technological usage.

## Md. Kamrul Islam

Sub. Assist. Engineer

Age : 52  
Working Area : Upazila  
Favorite Color : Blue

Professional

Technological Expert

### Usage

- Plan a Schedule and inform to the local contact person to arrange facilities.
- Collect inspection form and measurement tools
- Physically visit and inspection the structure
- Report preparation from LGED define format

### Pain Point



- Network issue to communication.
- File missing, previous data missing, difficult to understand inventory list as the form common for all structure.
- Have to decide condition from assumption.
- Difficult to collect Master Design copy, sometimes it needed for confusion
- Again Data Entry in another format to generate report.

### Nice to Have

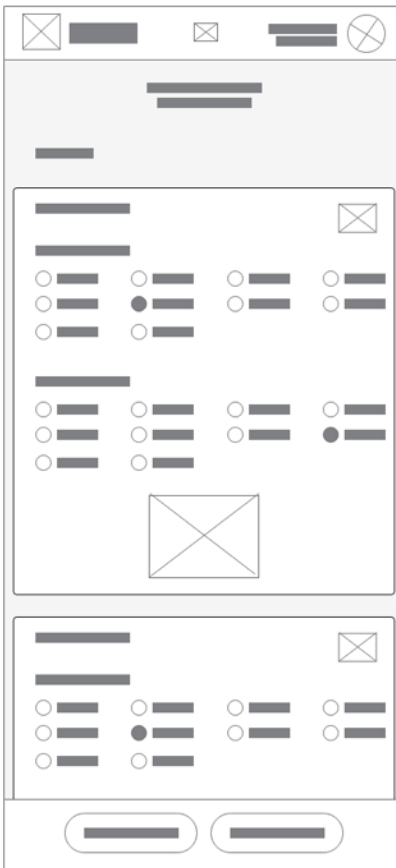
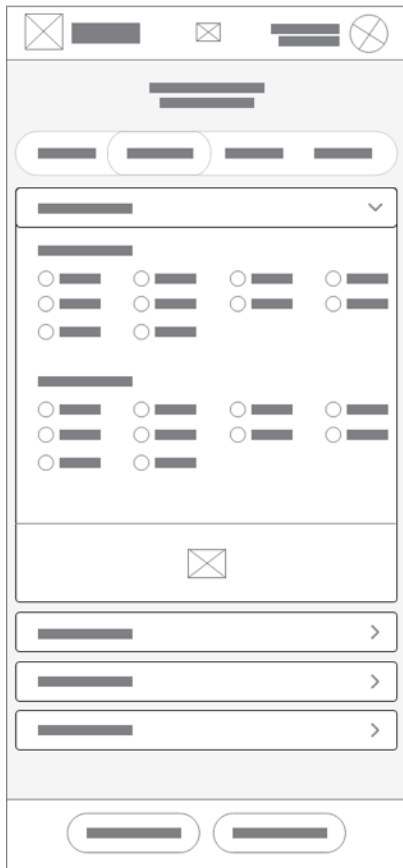
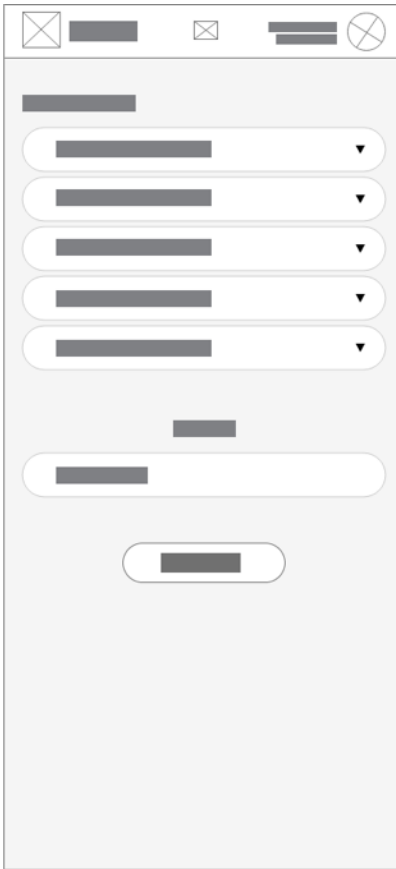


- A Central Data Repository to get information to decide a good decision.
- Workable Mobile Apps to Inspect online/offline both to remove network issues
- Geo-location wise Tracking, Detection notification for damage, overload etc.
- Appeal system to modify specific condition report.
- System should have defect calculation capacity



Wireframe

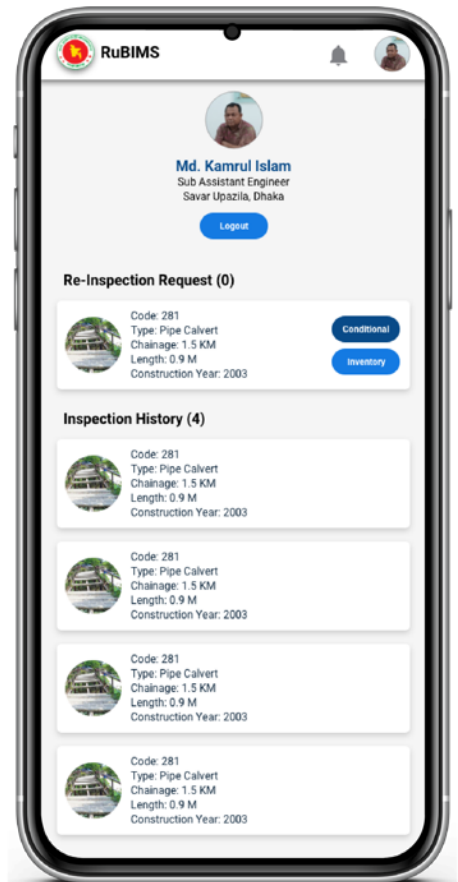
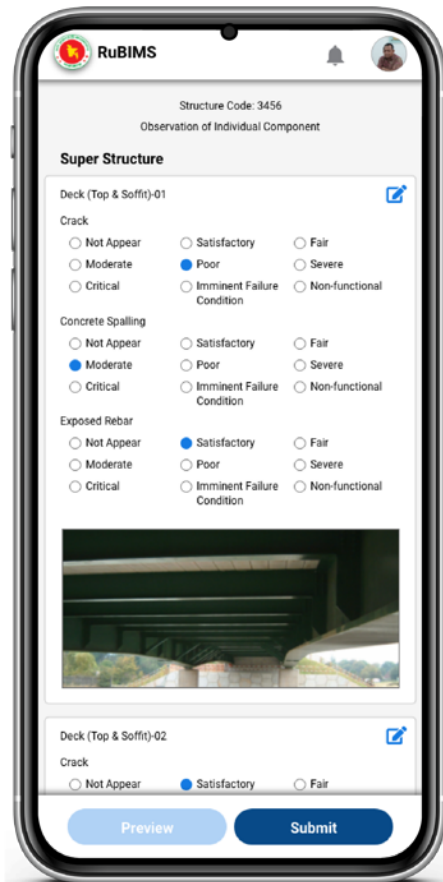
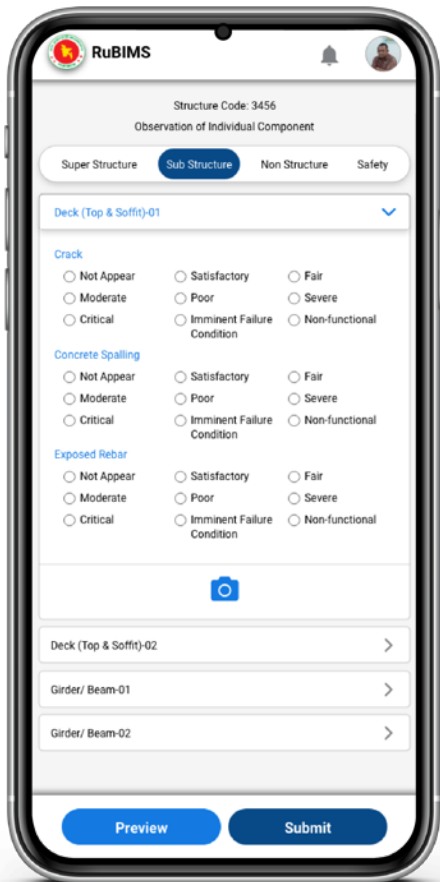
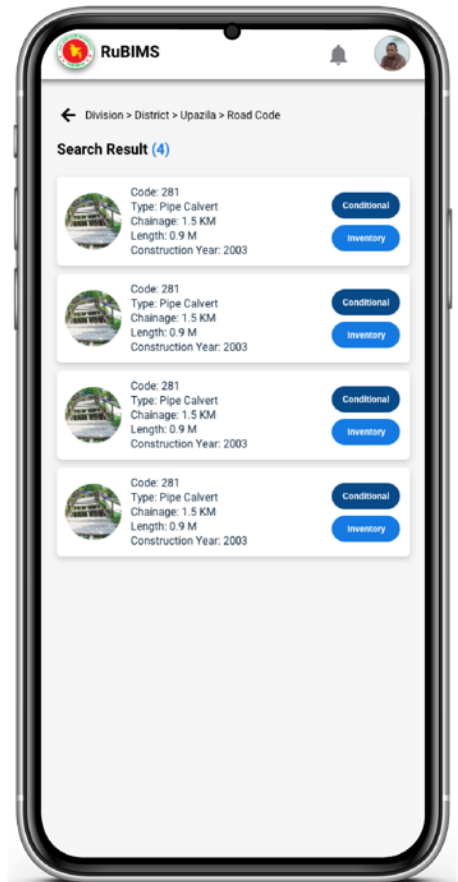
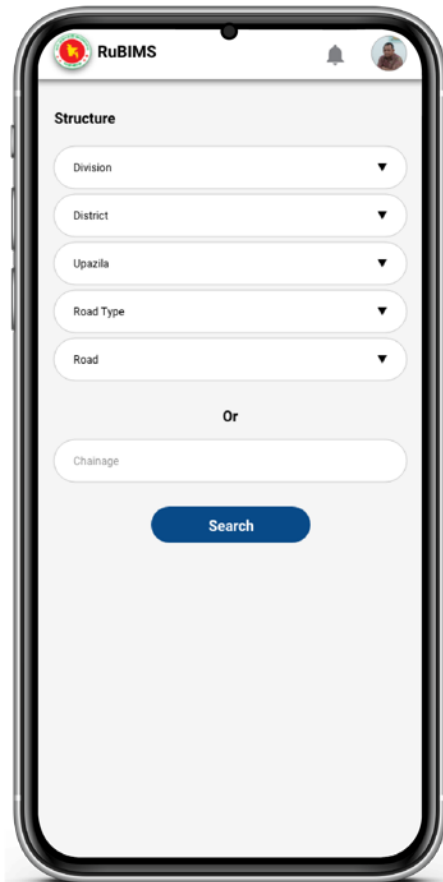
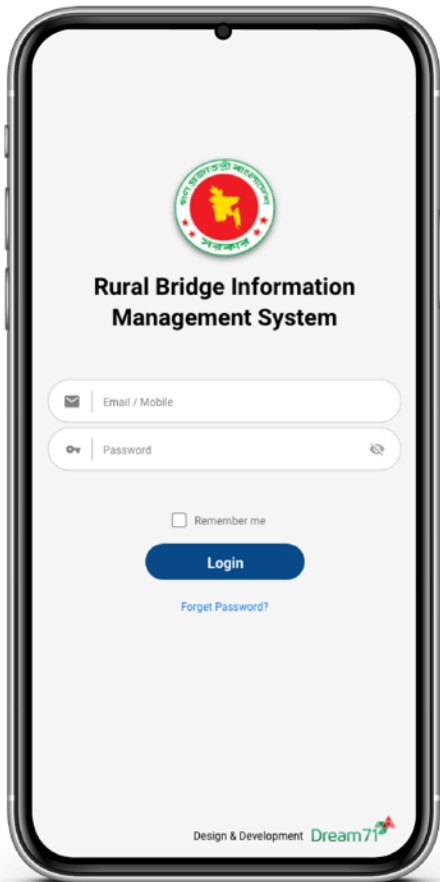
# Low Fidelity Mobile Apps



# Low Fidelity Web Apps



# High Fidelity Mobile Apps



Rural Bridge Information Management System

Alobbar Hossain

Admin

Dashboard
Structure Info
Inspections
Analysis & Planning
Reports
Common System

Total Structures

24,489

Total Structure Types

25

Total Structures Length (M)

3,66,230

Total Waterway (KM)

36,200

Total Chainage (KM)

48,978

Total RCC Bridges

20,000

Total Steel Truss Bridges

4,000

Total Bailey Bridges

489

Inspection Reports

30

Verified Reports

12

Approved Reports

8

Today's Analysis Process Run

2

### Structural Condition

Select Division
▼

Select District
▼

Select Upazila
▼

Select Road Type
▼

Select Road
▼

### Report Processing Rate

■	Verified	■	Approved
■	Process Run	■	Send to Review

### Total Structure : 3172

452

Satisfactory

400

Fair

430

Moderate

390

Poor

435

Severe

335

Critical

380

Imminent Failure Condition

350

Non-functional

### Top Priority

Structure Code : 432

Chainage : 5432

Structure Code : 432

Chainage : 5432

Structure Code : 432

Chainage : 5432

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Design & Development by Dream7i



Division District Upazilla Road Type Search

Road Code	Road Name	Facility Type	No.of Structure	Action
326182008	Joypara GC-Majhirchar bazar-Kutubpur-Debinagar-Kulchari-Kazirchar RHW Road	Upazilla Road	2	<a href="#">View Details</a>
326182008	Joypara GC-Majhirchar bazar-Kutubpur-Debinagar-Kulchari-Kazirchar RHW Road	Upazilla Road	2	<a href="#">View Details</a>
326182008	Joypara GC-Majhirchar bazar-Kutubpur-Debinagar-Kulchari-Kazirchar RHW Road	Upazilla Road	2	<a href="#">View Details</a>
326182008	Joypara GC-Majhirchar bazar-Kutubpur-Debinagar-Kulchari-Kazirchar RHW Road	Upazilla Road	2	<a href="#">View Details</a>
326182008	Joypara GC-Majhirchar bazar-Kutubpur-Debinagar-Kulchari-Kazirchar RHW Road	Upazilla Road	2	<a href="#">View Details</a>

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Structure Information

New Structure

Structure Code	Chainage	Structure Type	Carriage way width (m)	Length (m)	No.of Span	Construction Year	Construction Year Type	Action
77	380		0	8	0	0		<a href="#">Inspection</a> <a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>
77	380		0	8	0	0		<a href="#">Inspection</a> <a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>
77	380		0	8	0	0		<a href="#">Inspection</a> <a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>
77	380		0	8	0	0		<a href="#">Inspection</a> <a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>
77	380		0	8	0	0		<a href="#">Inspection</a> <a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>
77	380		0	8	0	0		<a href="#">Inspection</a> <a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>

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← Structure Code: 777

Update



Basic Information

Division	Dhaka	Structure Type	Bridge	Road Code	23456789
District	Gazipur	Structure Name	Girder Bridge	Road Name	Dhitpur-Hashir Halot road
Upazilla	Kapasia			Road Type	Village Road-B
Facility Type	Upazilla Road				

- Identification & Location
- Physical Characteristics
- Traffic & Loading Info
- Channel Information
- Structure History
- Structure Specific Information
- Design Info & Document

Chainage (m)	330
Length (m)	1.05
Latitude	--
Longitude	--
Feature Intersected	Not Found!



← Structure Code: 777

Update



Basic Information

Division	Dhaka	Structure Type	Bridge	Road Code	23456789
District	Gazipur	Structure Name	Girder Bridge	Road Name	Dhitpur-Hashir Halot road
Upazilla	Kapasia			Road Type	Village Road-B
Facility Type	Upazilla Road				

- Identification & Location
- Physical Characteristics
- Traffic & Loading Info
- Channel Information
- Structure History
- Structure Specific Information
- Design Info & Document

No. of Lanes	0.0	Max Span Length (m)	Pile foundation
Lane Width (m)	-- mm	Structure Length (m)	--
No. of Span	-- mm	Carriageway Width (m)	--
Clear Span (m)	-- mm	Crossing Width (m)	--
Min Span Length (m)	Pile foundation	Vertical Clearance	--



← Structure Code: 777

Update



Basic Information

Division	Dhaka	Structure Type	Bridge	Road Code	23456789
District	Gazipur	Structure Name	Girder Bridge	Road Name	Dhitpur-Hashir Halot road
Upazilla	Kapasia			Road Type	Village Road-B
Facility Type	Upazilla Road				

- Identification & Location
- Physical Characteristics
- Traffic & Loading Info
- Channel Information
- Structure History
- Structure Specific Information
- Design Info & Document

No. of Lanes	0.0	Max Span Length (m)	Pile foundation
Lane Width (m)	-- mm	Structure Length (m)	--
No. of Span	-- mm	Carriageway Width (m)	--
Clear Span (m)	-- mm	Crossing Width (m)	--
Min Span Length (m)	Pile foundation	Vertical Clearance	--



← Structure Code: 777

Update



Basic Information

Division	Dhaka	Structure Type	Bridge	Road Code	23456789
District	Gazipur	Structure Name	Girder Bridge	Road Name	Dhitpur-Hashir Halot road
Upazilla	Kapasia			Road Type	Village Road-B
Facility Type	Upazilla Road				

- Identification & Location
- Physical Characteristics
- Traffic & Loading Info
- Channel Information
- Structure History
- Structure Specific Information
- Design Info & Document

CVD	Concrete
AADT	Circular
Max Posted Vehicle Load	__MM__X
Max Accessed Vehicle Load	__MM__X



← Structure Code: 777

Update



Basic Information

Division	Dhaka	Structure Type	Bridge	Road Code	23456789
District	Gazipur	Structure Name	Girder Bridge	Road Name	Dhitpur-Hashir Halot road
Upazilla	Kapasia			Road Type	Village Road-B
Facility Type	Upazilla Road				

- Identification & Location
- Physical Characteristics
- Traffic & Loading Info
- Channel Information
- Structure History
- Structure Specific Information
- Design Info & Document

Name of Channel	--	Channel Protection	--
Channel Type	--	Channel Width (m)	--
Tide Type	--	High Flood Level (m)	--
Salinity	--		



← Structure Code: 777

Update



Basic Information

Division	Dhaka	Structure Type	Bridge	Road Code	23456789
District	Gazipur	Structure Name	Girder Bridge	Road Name	Dhitpur-Hashir Halot road
Upazilla	Kapasia			Road Type	Village Road-B
Facility Type	Upazilla Road				

- Identification & Location
- Physical Characteristics
- Traffic & Loading Info
- Channel Information
- Structure History
- Structure Specific Information
- Design Info & Document

Sub-Structure	--	Viaduct	--
Bearing Assembly	--	Approach	--
Super-Structure	--	Channel & Navigation	--
Deck	--	Safety Feature	--
Joint	--		



← Structure Code: 777

Update



Basic Information

Division	Dhaka	Structure Type	Bridge	Road Code	23456789
District	Gazipur	Structure Name	Girder Bridge	Road Name	Dhitpur-Hashir Halot road
Upazilla	Kapasia			Road Type	Village Road-B
Facility Type	Upazilla Road				

- Identification & Location
- Physical Characteristics
- Traffic & Loading Info
- Channel Information
- Structure History
- Structure Specific Information
- Design Info & Document

Design Load	--
Design Method	--
Load Bearing Capacity	--
Design Life	--



Pending Verified Approved Send to Review Ready for Analysis

+ New Inspection

Inspection ID	Inspection Date	Inspected By	Designation	Road Name	Road Type	Structure Code	Action
326182008	15/05/2022	Mr. Sample Name	Sr. Officer	Joypara GC-Majhirchar bazar-Kutubpur-Debinagar-Kulchari-Kazirchar RHW Road	Upazilla Road	777	View Details
326182008	15/05/2022	Mr. Sample Name	Sr. Officer	Joypara GC-Majhirchar bazar-Kutubpur-Debinagar-Kulchari-Kazirchar RHW Road	Upazilla Road	777	View Details
326182008	15/05/2022	Mr. Sample Name	Sr. Officer	Joypara GC-Majhirchar bazar-Kutubpur-Debinagar-Kulchari-Kazirchar RHW Road	Upazilla Road	777	View Details
326182008	15/05/2022	Mr. Sample Name	Sr. Officer	Joypara GC-Majhirchar bazar-Kutubpur-Debinagar-Kulchari-Kazirchar RHW Road	Upazilla Road	777	View Details



Analysis Planning

Dhaka  Dhaka  Dohar  Road Name  Structure Type   
 Length  Operator  Value  Scenario Name

Dhaka/Dhaka/Dohar: Sample Scenario Name

Road Name	Structure Code	Structure Type	Length (m)	Width (m)	Chainage (m)	SD Score	Socio-Economic Score	Priority Score	Ranking	Maintenance Type	Action
											<input type="button" value="View"/> <input type="button" value="Edit"/>
											<input type="button" value="View"/> <input type="button" value="Edit"/>
											<input type="button" value="View"/> <input type="button" value="Edit"/>

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← Structure Code: 777



### Basic Information

Division	Dhaka	Structure Type	Bridge	Road Code	23456789
District	Gazipur	Structure Name	Girder Bridge	Road Name	Dhitpur-Hashir Halot road
Upazilla	Kapasia			Road Type	Village Road-B
Road Type	Upazilla Road				

Condition State

Structural Deficiency (SD)

Priority Ranking Process ( 954.6)

### Traffic Volume (T)

3698 (0.68)

Peak	15 min
Vehicle	1116
PCU	1037
Peak	1 hour
Vehicle	4015
PCU	3698
AADT	
Volume	3698
Capacity	5400
V/C	0.68

### Socio-Economic Score (SC)

840

Name	Qty	Value	Total
Rural Market	2	4	8
Secondary School	1	5	5
Mosque	2	4	8
			21X40
			840





Analysis Planning

Create Schema

Scenario Name Total Cost : BDT 300,309,000/- Total Length (m) : 600

Maintenance Type Length/Cost Value Optimize

Export

Dhaka/Dhaka/Dohar: Sample Scenario Name

<input type="checkbox"/>	Road Name	Structure Code	Structure Type	Length (m)	Width (m)	Chainage (m)	SD Score	Socio-Economic Score	Priority Score	Ranking	Maintenance Type	Cost
<input checked="" type="checkbox"/>												
<input type="checkbox"/>												
<input type="checkbox"/>												

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